Do they intend to stay? An empirical study of commercial apprentices' motivation, satisfaction and intention to remain within the learned occupation

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Do they intend to stay? An empirical study of commercial apprentices' motivation, satisfaction and intention to remain within the learned occupation

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Abstract

Background: Commercial apprenticeship is the most commonly chosen type of apprenticeship within vocational education training in Switzerland. Both the Swiss economy and the training companies themselves benefit when apprentices remain within the occupation and company after their vocational education and training has ended. However, little is known about commercial apprentices' intention to remain and its development. The literature discusses learning motivation and (apprenticeship) satisfaction as important factors in the development of the intention to remain from both a theoretical and an empirical perspective. We report the status quo of further educational and working intentions at the end of apprenticeship training and interdependency of the remaining intention's, learning motivation's and training satisfaction's development. To do so, we propose a cross-lagged structural equation model that examines the constructs' autoregressive paths but also causal effects on each other over time.

Methods: We present empirical data gathered in a representative sample of 83 classes (n = 1905) of commercial apprentices of both the E- and M-Profile in German-speaking regions of Switzerland. The apprentices participated in the standardized survey four times in total: at the beginning, at a halfway point during their apprenticeship, half a year before final examinations and two to three months before termination. Hypotheses were tested using descriptive methods as well as latent state models and a cross-lagged structural equation model.

Results and conclusions: It was found that a majority of commercial apprentices intend to remain within the learned profession after graduation (57.7%). However, one in five apprentices does not have such intentions, and one in four apprentices is still undecided. Slightly less than 60% of apprentices had a follow-up solution after finishing their training and more than 80% of them planned to remain employed within their training company. Despite their follow-up positions, commercial apprentices tend to continue their education. Only 6% of the apprentices denied having any further educational intention within the next five years. With regard to the intention to remain within the learned occupation, training satisfaction was found to be an important factor. The intention to remain within the occupation also increases training satisfaction. Although learning motivation does not seem to directly affect the intention to remain within the learned occupation, it nevertheless affects training satisfaction positively.

For policy-makers, teachers, trainers and educators, it is important to understand the factors that positively contribute to the intention to remain within the learned profession. Therefore, the current study can be considered a starting point. However, more research is needed.

Keywords: Commercial vocational education, Learning motivation, Training satisfaction, Intention to remain within the learned occupation, Cross-lagged panel design

Introduction

In Switzerland, vocational education and training (VET) has a good reputation and is an important part of the educational system. Thus, VET positively affects the economy in Switzerland (Hoeckel et al. 2009). As Petrin and Schmid (2006) emphasized, "the dual system of vocational education has turned out to be a stroke of luck and a fundamental factor of success for the knowledge-based Swiss national economy" (p. 78). In Switzerland, two-thirds of all adolescents enroll in vocational education and training (VET) after completing compulsory education, as reported in the most recent facts and figures on vocational education, published by the State Secretariat for Education, Research and Innovation (SERI 2016). Commercial apprenticeship constitutes 19.5%[1] of the federal diploma of competence (graduation degree) and represents the most commonly chosen dual vocational training in Switzerland. Consequently, this apprenticeship has unique value for the Swiss economic and educational system.

Dual VET is organized as collaboration among training companies, schools and industry courses. An initial obstacle for adolescents entering VET is to find a position in a company where an apprenticeship is offered (see also Forster-Heinzer 2015). Since it is not a matter of course for companies to offer apprenticeship training, one important condition for the success of the VET system is the willingness of companies to train apprentices. Research has shown that companies that offer apprenticeship training are often motivated to recruit their own personnel or to contribute well-educated specialists to their occupation and the economy (Hanhart and Schulz 1998; Forster-Heinzer 2015; Muehlemann and Wolter 2007; Wettstein et al. 1985). As Muehlemann et al. (2007) and Schweri et al. (2003) have emphasized, it is not only economically important that educated apprentices remain within the profession; training companies also benefit if their apprentices remain within the company after training because they provide a solid basis of continuity for employees and companies. It is estimated that opportunity returns amount to 30,000 Swiss Francs for larger-sized training companies in the commercial field that fill vacancies internally with trained former apprentices (Schweri et al. 2003, p. 127). Muehlemann et al. (2007) found that approximately 30% of the Swiss commercial companies that offered training positions in 2000 stopped doing so in 2004 (p. 115). Their analysis showed that the companies that no longer offered apprenticeship positions had higher additional costs of more than 20,000 Swiss Francs. In this respect, apprenticeship training was no longer profitable for the affected companies. Another important finding, also reported by Muehlemann et al. (2007), is that the commercial field puts more effort into students who perform poorly at school (p. 95). The expectation that

[1] https://www.pxweb.bfs.admin.ch, status 2014.

these apprentices are more likely to remain within the occupation instead of continuing further education might be one reason for this trend. However, this is only an assumption that must be empirically confirmed.

Despite the importance of this issue, a literature review shows a lack of research on the development of the intention to remain within the learned occupation during apprenticeship training. Moreover, little is known about commercial apprentices' professional development and future career intentions (e.g., remaining within the profession, pursuing further education or changing professions) despite its significance within VET. This paper therefore seeks to close this gap in knowledge by studying commercial apprentices' intention to remain within the learned occupation and the development of this intention through apprenticeship training as well as their learning motivation and apprenticeship satisfaction. The existing literature provides evidence that motivation and job satisfaction are important contributing factors in a professional's intention to remain in his or her learned occupation and position (Bergmann 1992; Coomber and Barriball 2007; Duraisingam et al. 2009; Rosser 2004; Sembill 1992). Moreover, motivation is assumed to have a positive influence on professional satisfaction (Holland 1985) and is thus considered a key element in remaining within the profession (Jiménez 2002; Lambert et al. 2001). Furthermore, learning motivation is believed to positively impact the learning success of vocational education (Hardt et al. 1996).

Study objectives and research questions

The research desideratum leads to two main objectives for this paper. First, we aim to report (a) the status quo of commercial apprentices initial career aspirations, (b) their intention to remain within the occupation, (c) their further education intentions and (d) the prospects of follow-up solutions after completing training. Second, we analyze the interdependence of the construct developments of learning motivation, apprenticeship satisfaction and the intention to remain within the occupation. For this purpose, a trivariate cross-lagged-panel design was tested, as explicated below.

Before presenting the research design and hypotheses, we discuss previous studies and results regarding the intention to remain within the learned occupation, learning motivation, and training satisfaction. Furthermore, the unique characteristics of dual commercial VET are explained in detail because commercial apprentices are the target group of the current study.

Background

Commercial VET in Switzerland

Given both its importance to the economy and its unique characteristics, commercial VET in Switzerland is described in some detail to better contextualize the study presented herein. Additionally, some information about early termination of apprenticeship contracts as well as further career paths after the completion of training will be reported.

Characteristics of commercial apprenticeship training

Regardless of the chosen apprenticeship, dual VET combines formal education in a school setting with practical on-the-job training (Burkhalter 2013). With respect to the commercial field, 21 branches offer apprenticeship training, such as the service and

administration branch, the bank sector and the food industry (a list of all 21 branches and the percentage of trained apprentices is provided in the Additional file 1: Table S1).

Compared to similar VET programs in countries such as Germany or Austria, the Swiss commercial apprenticeship is characterized by a unitary vocational school education. This means that regardless of their training company's branch, commercial apprentices are in the same class. As such, an apprentice who completes a commercial apprenticeship in a bank has the same school-based education as an apprentice who completes a commercial apprenticeship in public administration or a travel agency. In comparison, in Germany, more than 50 commercial apprenticeship tracks exist (Brötz and Schapfel-Kaiser 2010, p. 28).

The other two learning venues of dual commercial VET—in-house training and industrial courses—are organized in a branch-specific way. This fact presents a challenge for VET. At the end of the apprenticeship training, every educated commercial apprentice should be qualified to work in all 21 commercial branches. Commercial apprenticeship is offered at three aspiration levels: (1) basic education (B-Profile), (2) advanced education (E-Profile), and (3) advanced education with a federal vocational baccalaureate (E +/M-Profile[2]). All three types of apprenticeship take three years to complete. In this study, we focus on the E- and M-Profiles, which have the same commercial school education. Within school education, an important focus is placed on the subject of economics and society (E&S), which is considered essential for commercial branches. Thus, the contents virtually defines the core of the occupation. This subject includes economics, business administration, law, finance and accounting as well as history and political science. In contrast to the E-Profile apprentices, apprentices in the M-Profile attend a federal vocational baccalaureate. Consequently, after completing the commercial VET program, M-Profile apprentices are qualified to study at a university of applied sciences.

As emphasized earlier, it is tremendously important both for training companies and for the Swiss economy as a whole that trained commercial workers (i.e., former apprentices) remain within the profession. Unfortunately, no separate statistics exist for the commercial field with regard to remaining intentions, early contract termination or professional transition.

Early termination and continuation in (commercial) VET

Because little is known about the intention to remain after completing VET, we examined reasons for early termination during VET that might influence the decision not to remain within the occupation.

Depending on the method of calculation, different rates of early apprenticeship termination are reported. Schumann et al. (2014) report an average early training contract termination rate of 28%, ranging from 10 to 50% depending on the profession (p. 14). Wettstein and Minder (2012) calculated an early contract termination rate of approximately 9.9% in the Canton of Zurich in 2011, in comparison with 8.1% in Canton Bern and 8.9% in Canton Aargau. With regard to commercial apprenticeship, no national

[2] The new notation of advanced commercial apprenticeship with federal vocational baccalaureate is E+-Profile instead of M-Profile. Due to the fact that apprentices in our sample were educated according to the old educational regulations, we still call them M-Profile apprentices.

statistics exist. Compared to other apprenticeship programs, however, it seems that commercial apprenticeship has low rates of early training contract termination. Stalder and Schmid (2006) reported a rate of 11 to 12% in Canton Bern (p. 46). According to Heim et al. (2012), approximately 5% of commercial apprentices in the Canton of Bern interrupt training without a follow-up solution within the same field. More than half of annual terminations happen within the first year of apprenticeship training (Wettstein and Minder 2012). Reasons for the early termination of training contracts are multifarious (Stalder and Schmid 2006). Decreases in motivation or interest as well as low educational satisfaction are among these reasons (ibid).

In summary, early termination of apprenticeship training seems less a problem in the commercial field. However, this result does not address the question of whether apprentices who completed their commercial VET also intend to remain within the learned occupation. Since 2006, the Commercial Association of Switzerland has questioned commercial apprenticeship graduates on an annual basis about their transition to work life as well as further education intentions and retrospective training satisfaction (Wicki and Kraft 2013). In 2013, graduates were questioned twice: in July shortly after final exams were given and again in November. It was found that in July, 60% of graduates had a job position after training; however, in November, this number was almost 73%. Others were either looking for employment or otherwise occupied (Wicki and Kraft 2013, p. 18). Reasons for not seeking employment included plans for further education, a stay abroad or military service (ibid). Differentiation between the profiles showed that in July 2013, 59% of E-Profile and 69.4% of M-Profile apprentices had a follow-up job position, 20.3% of E-Profile and 10.6% of M-Profile apprentices reported no need for a job position, and 15.6% of E-Profile and 13.6% of M-Profile apprentices were still looking for a follow-up solution (Wicki and Kraft 2013). Furthermore, the authors report that more than 80% of graduates with an apprenticeship in the bank branch found a follow-up job position, and 90% of them stayed within the training company. Unfortunately, the authors give no information as to whether the follow-up job positions were found within the commercial field. Moreover, a small sample of apprentices was questioned on a voluntary basis; therefore, these results should be considered with caution. It will be interesting to compare these results with the apprentices' situation in our study.

Remaining intention, motivation and satisfaction

As mentioned, the existing literature provides evidence that motivation and satisfaction are important factors that affect the intention to remain within the learned occupation. Therefore, these constructs will be briefly discussed in the next paragraph.

The intention to remain within the learned occupation

Studies addressing the intention to remain within the commercial occupation are rare. Important exceptions are the work of Lehmann et al. (2013a, b) as well as Lehmann and Hunger (2013), also known as ULME studies I to III. Over several years, the authors investigated the performance, motivation and attitudes of apprentices in dual VET in Germany. The second ULME study (Lehmann et al. 2013b) analyzed factors that influence the success and failure of apprenticeship training. The authors assumed that motivation was an important factor in addition to performance, gender and migration.

Unfortunately, however, motivation was not included in these calculations. In the context of ULME III, Seeber (2013) reported that most of the apprentices (approximately 76%) realized their initial career aspiration (p. 76). Of the adolescents who could not follow their occupational intentions, only a few were determined to work prospectively in the learned occupation. Furthermore, the author found that one-third of the apprentices had a follow-up solution three months before completing the training. Of these apprentices, 92% planned to continue working in the training company (Seeber 2013, p. 96). Only 12% of the apprentices were uncertain about what to do next, whereas the others all had a clear picture of their next steps.

A larger body of literature, also including literature that considers other occupations, has addressed the interruption of an occupational track or the transition from education to work. Generally, the transition at thresholds (e.g., from school to training or from training to work) is considered an important developmental task (Gerber-Schenk et al. 2010; Schörger et al. 2013). "A positive socialization ideally leads to high work motivation and work satisfaction, a long-term organizational commitment and therewith to the decrease of fluctuation" (Schörger et al. 2013, p. 42, translated by the authors). Briedis et al. (2008) reported that a lack of motivation is one of the most important reasons for humanist students to interrupt their studies. Neuenschwander (2014) and Gerber-Schenk et al. (2010) found that (achievement) motivation was more important for the transition from apprenticeship training to work than performances at school or in a company. More research regarding the remaining in the occupation has been done in the field of teaching. Herzog et al. (2007) found motivation and satisfaction to be important reasons for occupational ups and downs. Moreover, occupational satisfaction was an important reason for remaining within teaching and for interrupting or changing professions (ibid).

Learning motivation

Generally speaking, "motivation is the study of the determinants of thought and action—it addresses why behavior is initiated, persists, and stops, as well as what choices are made" (Weiner 1992, p. 17). Motivation is thus considered to give an individual's actions intensity, direction and persistency (Metz-Göckel 2001). As Eccles and Wigfield (2002) emphasize, "the Latin root of the word 'motivation' means 'to move'" (p. 110). Martin and Dowson (2009) define motivation as "a set of interrelated beliefs and emotions that influence and direct behavior" (p. 328). In the current paper, the concept of learning motivation constitutes the primary focus of interest. The question is how the motivation to learn the content of the subject of economics and society (E&S) develops and to what extent it influences the intention to remain within the learned occupation. The main reason for addressing the learning motivation in E&S is that this subject characterizes the core of commercial activities best. It is assumed that without motivation for the specifics of the occupation, the intention to remain stays low. Thus, as Beck (2000) noted, learning motivation is an important condition for the apprentice's active engagement with and examination of the contents and procedures of the prospective occupation (p. 24).

Within the last twenty years, the theories of self-determination by Deci and Ryan (2008, 1993) as well as the theory of interest by Krapp (2005a) have become the two

leading approaches to learning motivation in the pedagogical context (Scheja 2009; Schumann 2010; Winther 2006). On the one hand, Deci and Ryan (1993) differentiated between extrinsic and intrinsic motivation. These two dimensions are considered graduations of self-determination. Therefore, extrinsic and intrinsic motivation are not understood as opposite but rather as equally important orientations for learning. "Although intrinsic motivation is clearly an important type of motivation, most of the activities people do are not, strictly speaking, intrinsically motivated. This is especially the case after early childhood, as the freedom to be intrinsically motivated becomes increasingly curtailed by social demands and roles that require individuals to assume responsibility for non intrinsically interesting tasks. In school, for example, it appears that intrinsic motivation becomes weaker with each advancing grade" (Ryan and Deci 2000, p. 60). Hardt et al. (1996) emphasized that it is more important that the motivation stimulates the learner to actively engage in the learning content than whether the learning is motivated intrinsically or extrinsically (p. 236). Ryan and Deci (2000) distinguish external regulation, introjection, identification and integration, which all belong to extrinsic motivation, from amotivation and intrinsic motivation. Whereas intrinsic motivation is the most self-determined, amotivation is the least self-determined. The authors (Deci and Ryan 2008; Ryan and Deci 2000) based their motivational theory on the idea of basic psychological needs,[3] which nourish self-determined motivation. Empirical results show that forms of learning motivation based on self-determination and interest lead to better learning achievement (Winther 2006, p. 37). Thus, intrinsically motivated persons have been found to harbor a deep intellectual curiosity and to elaborate knowledge structures, which they keep in mind for longer periods (Lewalter et al. 2001). Moreover, self-determined motivation seems to support the development of (professional) identity (Hausser 1983). On the other hand, interest is considered another important aspect of intrinsic motivation (Krapp 1998, 2005a, b; Krapp and Lewalter 2001; Lewalter et al. 2001; Schiefle and Streblow 2005). Interest is understood "as a motivational component of learning and human development that is always related to a specific content or 'object' of knowledge and competence acquisition" (Krapp and Lewalter 2001, p. 209). In this context, interest is not understood as a personality trait but as a relational concept. Bergmann (1992) argued that interest influences the development of educational and professional aims as well as decision-making with regard to whether one remains within a chosen field. In this regard, it is assumed that learning motivation has an impact on apprentices' intention to remain.

Prenzel et al. (1996) combined these two approaches with an instrument measuring six different forms of learning motivation: amotivation, extrinsic motivation, identified motivation, introjected motivation, intrinsic motivation and interest. These six forms are stepline positioned into a coordinate system. The abscissa (x-axis) represents a graduation of content incentives (interest), and the ordinata (y-axis) represents a graduation of self-determination. Whereas amotivation is low with regard to content incentives and self-determination, interest is high on both axes (Prenzel 1997, p. 35). Scheja (2009) discusses

[3] Three important needs that are found to predict psychological well-being in all cultures are the need for (a) competence, (b) autonomy, and (c) relatedness (Deci and Ryan 2008).

this hierarchical arrangement critically. The author argues that intrinsic motivation generally is considered the pedagogical goal. She emphasizes that the excessively high value of intrinsic motivation would contradict the pedagogical intention to foster awareness for reliable and responsible occupational acting. Thus, in the context of lifelong learning, the importance of detecting and closing knowledge gaps is postulated independent of whether this is done with joy and delight (ibid, p. 2). The instrument of learning motivation, developed by Prenzel et al. (1996) has been frequently used and adapted in the field of VET (Beck 2000; Knöll et al. 2007; Nickolaus and Ziegler 2005; Prenzel and Drechsel 1996; Schumann 2010; Seidel et al. 2003; Seifried 2005; Winther 2006;). These studies primarily refer to data collected in Germany. Beck (2000), Prenzel and Drechsel (1996) and Scheja (2009) report that apprentices are generally more motivated for learning at work (company) than they are for school learning. However, apprentices ascribe the same relevance to school content as they do to learning content at a company (Prenzel and Drechsel 1996, p. 231). Several authors have studied the development of learning motivation during professional education, such as Knöll et al. (2007) and Wild and Krapp (1996). In both studies, the authors found that learning motivation scores at the beginning of training were generally high, though they also observed a significant decrease in these scores during the first year of training that nevertheless remained at a positive level. In addition, Wild and Krapp (1996) found that for 33% of the apprentices questioned, their commercial apprenticeship did not correspond to their initial career aspirations (p. 96). Consequently, the authors emphasized that motivational orientation is particularly important with regard to an individual's willingness to pursue further education. The authors contended that if VET is successful in establishing motivational professional orientation and profession-related interest, it provides the foundation for training and professional success as well as for high satisfaction within the profession. Hardt et al. (1996) found a decrease in commercial apprentices' learning motivation during training. Prenzel et al. (1996) confirmed this decrease in learning motivation over the first year of commercial apprenticeship. The authors defined self-determination and content incentives (i.e., interest in the content) as two of the most important components of learning motivation and argued that these factors may be especially meaningful for training success. Indeed, several studies have shown that the quality of learning motivation significantly influences the quality of learning processes and learning outcomes (Benware and Deci 1984; Grolnick and Ryan 1987; Prenzel et al. 1996). The results of a study conducted by Prenzel and Drechsel (1996) indicated an effect of learning motivation on work satisfaction (p. 219). Thus, the authors concluded that identification, intrinsic motivation and interest foster cognitive processes and the results of learning, positive emotions while learning, the development of identity, work satisfaction, identification with the learned occupation and the willingness for further education.

Another dimension of learning motivation that was not considered by Prenzel et al. (1996) is achievement (Ramseier 2004; Winther 2006). Theories of achievement motivation describe learning motivation as an instrument of instrumental calculation (Winther 2006, p. 19). Such theories assume that people learn not only because of interest or a feeling of self-determination but also because they consider the learned content to be useful for later purposes or because they want to achieve. In our study (see section instruments), we adapted the instrument of Prenzel et al. (1996) and supplemented it

with two dimensions developed by Ramseier (2004), which capture these two additional dimensions of learning motivation.

Job or apprenticeship satisfaction

Whereas motivation is discussed primarily with regard to its significance for learning success and achievement, job satisfaction is more directly linked to turnover intention and the likelihood that a worker will remain within a job or organization. In the field of nursing in particular, numerous studies have analyzed reasons for the intention to leave the profession or organization (Coomber and Barriball 2007; Larrabee et al. 2003; Lu et al. 2002; Shader et al. 2001; Shields and Ward 2001). However, the importance of job satisfaction has also been confirmed with regard to leaving intentions in other fields (Duraisingam et al. 2009; Kim et al. 2005; Rosser 2004). A distinction is made between the intention to leave a job or profession (i.e., turnover intention) and actual turnover. However, intention is known to be an actively formulated proposition to act and therefore a strong predictor of actual behavior (Ajzen 1991; Heckhausen and Heckhausen 2006). The cognitive process of turnover intention has been empirically confirmed as the most important predictor of realized turnover (i.e., leaving an organization or job), as Rosser (2004) and Coomber and Barriball (2007) have reported. Hence, people with an intention to leave are naturally more likely to quit (Rosser 2004). The intention to leave is significantly influenced by job satisfaction (Larrabee et al. 2003; Rambur et al. 2003; Rosser 2004; Shader et al. 2001). Shields and Ward (2001) even found a 65% higher probability of intention to quit among nurses who reported overall dissatisfaction with their job (p. 67). Furthermore, according to Duraisingam et al. (2009), low levels of job satisfaction have proven to be the most significant predictor of turnover intentions (p. 10). However, job satisfaction was found to be more effective in predicting the intention to leave an organization than to the intention to leave a profession (Lu et al. 2002, p. 218). Rambur et al. (2003) reported that the intention to leave a position associated with job satisfaction decreased with educational level, enrollment in an educational program and advanced age. However, Coomber and Barriball (2007) noted inconsistent findings in their meta-analysis regarding the influence of educational level on job satisfaction. With regard to the field of education, Heidemann et al. (2003) analyzed reasons for changing the educational program and found that, inter alia, misconceptions about educational programs and dwindling interest were important reasons (p. 21).

Regarding the construct of job satisfaction, a distinction is made between an overall (i.e., global) feeling about a job and 'related attitudes about various aspects of the job' (Coomber and Barriball 2007, p. 299). In our study, we focus on the general feeling of apprenticeship satisfaction because the apprentices just started their training at the first measurement point. We assume that they will develop articulated attitudes about their job during their commercial VET. As will be outlined in *Data and methods* section, an adapted version of the satisfaction scale developed by Ditton (2001, in Jerusalem et al. 2009) was employed to measure apprenticeship satisfaction.

In the following section, we investigate the development and correlations among commercial apprentices' learning motivation, apprenticeship satisfaction and intention to remain.

Data and methods

Research design

This paper reports findings from a quantitative longitudinal study with a total of four measurement points. The study is embedded in a larger project 'Learning and Instruction for Commercial Apprentices' (LINCA). The study's timetable is presented in Table 1. Along with other information, apprenticeship satisfaction and the intention to remain within the learned profession were examined at each measurement point. The scale of learning motivation was not established in the last data collection. The majority of questions consist of closed items with a fixed response pattern. The questionnaire format involves a paper and pencil test, which took the apprentices approximately 20 min to complete.

Sampling procedure and sample size

The population consists of all German-speaking commercial dual VET schools that offer classes for both the E- and M-Profiles. The data represent a random disproportional sampling. Corresponding numbers of E- and M-Profile classes were considered, although more E-Profile classes exist. With this disproportional sampling, we aimed to generate group comparisons. Further considerations supporting this decision were the anticipation of data loss over the four data collection points and an interest in generating sufficient data for statistical analysis. Finally, 35 schools with 83 classes of 15 cantons and 1905 commercial apprentices constituted our sample. Professionally educated test administrators controlled for standardized testing situations on site.

At the first data collection, 1671 commercial apprentices participated (valid n). The second data collection provided information on 1454 apprentices. The third measurement point provided information on 1324 apprentices and the fourth provided information on 1167 apprentices. Data matching showed that 932 commercial apprentices participated in all four measurements. A total of 599 (64.3%) of them were female, and

Table 1 Sample characteristics of the four measurement points

Measurement point	1. Measurement t_1		2. Measurement t_2		3. Measurement t_3		4. Measurement t_4	
Duration	November/December 2012		January/February 2014		January/February 2015		April/May 2015	
Total n[a]	1.757		1.585		1.482		1.367	
Valid n[b]	1.671		1.454		1.324		1.167	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Sex								
Male	615	36.8	536	36.9	483	36.5	406	34.8
Female	1.056	63.2	918	63.1	841	63.5	761	65.2
Profile								
E-Profile	847	50.7	740	50.9	678	51.2	590	50.6
M-Profile	824	49.3	714	49.1	646	48.8	577	49.4
	M	**SD**	**M**	**SD**	**M**	**SD**	**M**	**SD**
Age	16.9	1.5	18.1	1.5	19.1	1.5	19.4	1.5

[a] According to the class list

[b] Present during survey

333 (35.7%) were male. Over all measurement points, approximately one-third of the participating sample were male apprentices, and two-thirds were female apprentices. This ratio represents the population's distribution of commercial apprentices. Slightly more apprentices attended the E-Profile, although the ratio was almost equal. At the first measurement point, the apprentices were asked whether their commercial apprenticeship would be a compromise. Only 8.3% of the apprentices (valid n = 1668) answered this question affirmatively. For most apprentices, the commercial apprenticeship training seems to correspond with their initial aspirations.

Scales and measures

In addition to demographic information (e.g., gender, age, branches), apprentices were questioned with regard to their learning motivation, satisfaction with apprenticeship and professional intention to remain. In most cases, we refer to already implemented and empirically confirmed scales (see Table 2).

In a first step, the items of the scales learning motivation and apprenticeship satisfaction were tested for their appropriateness and factor structure by means of an Exploratory Principal Component Analysis with Varimax Rotation for each measurement point individually. Next, the explorative extracted factor structure was tested through confirmatory analysis by means of the statistical software Mplus.

Measurement of learning motivation

The scales of learning motivation were deployed three times (last measurement point excluded). To measure the apprentices' learning motivation, the scale developed by

Table 2 Overview of instruments implemented

Scale	Author/year	Item example	# of items
Learning motivation[b]		With regard to the subject E&S,..	24
Amotivation[a]	Prenzel et al. (1996)	…, I try to duck out of learning.	3
External motivation[a]	Prenzel et al. (1996)	…, I would not learn without external pressure.	3
Introjected motivation[a]	Prenzel et al. (1996)	…, I learn in order to meet expectations.	3
Identified motivation[a]	Prenzel et al. (1996)	…, I learn to come close to my personal aims.	3
Intrinsic motivation[a]	Prenzel et al. (1996)	…, learning time goes quickly.	3
Interest[a]	Prenzel et al. (1996)	…, I learn with enormous curiosity.	3
Long-term-instrumental oriented[b]	Ramseier (2004)	… I work because it will be of use for my occupation.	3
Achievement oriented[b]	Ramseier (2004)	… I work because I want to be good at everything.	3
Apprenticeship satisfaction[c]	Ditton (2001) in Jerusalem et al. (2009)	I am very satisfied with my commercial apprenticeship.	3
Intention to remain[d]	own item	Do you want to continue working within the commercial field after apprenticeship?	1

[a] Scale: 1 = 'never' to 6 = 'very often'

[b] Scale: 1='I do not agree', 2='I do rather not agree', 3='I do rather agree', 4='I do'

[c] Scale: 1 = 'does not apply at all' to 6 = 'does apply strongly'

[d] Scale: 0='no', 1='maybe/undecided', 2='yes'

Prenzel et al. (1996) was adapted to the school subject 'Economics and Society' (E&S). This instrument has been frequently applied to measure the development of learning motivation within commercial apprenticeship training (Beck 2000; Knöll et al. 2007; Nickolaus and Ziegler 2005; Prenzel and Drechsel 1996; Schumann 2010; Seifried 2005; Seidel et al. 2003 Winther 2006). The instrument consists of 18 items underlying six subdimensions of learning motivation: (1) amotivation, (2) extrinsic motivation, (3) identified motivation, (4) introjected motivation, (5) intrinsic motivation and (6) interest. A six-point Likert scale ranging from (1) 'never' to (6) 'very often' define the response possibilities. This scale was complemented with two dimensions developed by Ramseier (2004), namely, long-term-instrumental oriented learning motivation and achievement-oriented learning motivation. The items of the belonging scales are answered on a four-point Likert scale ranging from (1) 'do not agreed' to 'fully agree' (4).

Regarding Prenzel et al.'s instrument, many researchers have confirmed the consistency of the scale. In retrospective, however, it seems that those researchers only confirmed the Cronbach's alpha of the single dimensions without testing for the replication of the factorial structure by means of an explorative factor analysis (EFA) or the modeling of the underlying latent structure (confirmatory factor analysis, CFA). Researchers who calculated an EFA (such as Schumann 2016; Petsch et al. 2015; Winther 2006) reported some problems with the scale's consistency.

By means of a factor analysis (PCA; Varimax; eigenvalue), we tested whether all items measuring learning motivation reproduced the eight expected subscales. For each of the three time-points of measurement, the result was the same: only four dimensions could be extracted (see Table 3 for scale statistics). The long-term instrumental-oriented learning motivation (Cronbach's alpha .83–.88) and the achievement-oriented learning motivation (Cronbach's alpha .77–.86) developed by Ramseier (2004) proved to be clearly independent and distinct dimensions. Regarding Prenzel et al. (1996) formulated subdimensions, it was not possible to differentiate intrinsic motivation and interested motivation. This result corresponds to the findings of Petsch et al. (2015) and Winther (2006). In accordance with Winther (2006), we summarized these two sub-dimensions under the label of self-determined motivation (Cronbach's alpha .82–.86). Like Schumann (2016), we could not confirm the different forms of extrinsic motivation. In fact, only one additional sub-dimension summarizing the lowest forms of interested and self-determined learning (Prenzel et al. (1996) call them amotivation and external motivation) was confirmed. We named this scale external motivation (Cronbach's alpha .77–.79).

Since these four dimensions are supposed to measure learning motivation, in the next step, a second-order measurement model was developed.

Measurement of apprentices' training satisfaction

To measure commercial apprentices' training satisfaction, a scale developed by Ditton (2001, cited from Jerusalem et al. 2009) was shortened and adapted to commercial apprenticeship. In total, the scale included three items asking whether apprentices were generally satisfied with their commercial apprenticeship. Moreover, the scaling was increased to a six-point Likert scale ranging from (1) 'does not apply at all' to (6) 'does apply strongly,' instead of a four-point Likert scale. Thus, the scale was implemented in a longitudinal study. With a six-point Likert scale, more variance and a clear picture of

Table 3 Overview of scale characteristics

Scale	# Of items	Valid N				Scale mean (SD)								Cronbach's alpha			
		t_1	t_2	t_3	t_4	t_1		t_2		t_3		t_4		t_1	t_2	t_3	t_4
						M	SD	M	SD	M	SD	M	SD				
Learning motivation																	
Achievement-oriented motivation[a]	3	1644	1404	1290	–	2.87	.64	2.77	.70	2.68	.72	–	–	.77	.83	.86	–
Long-term instrumental motivation[a]	3	1649	1404	1291	–	3.07	.65	2.88	.71	2.76	.73	–	–	.83	.84	.88	–
Self-determined motivation[b]	6	1649	1417	1294	–	3.48	.90	3.36	.96	3.29	.98	–	–	.82	.84	.86	–
External motivation[b]	5	1654	1425	1291	–	2.37	.93	2.5	.96	2.63	1.03	–	–	.78	.77	.79	–
Apprenticeship satisfaction[b]	3	1662	1445	1324	1155	4.95	.96	4.56	1.14	4.31	1.15	4.25	1.16	.86	.88	.87	.88

[a] Answers on a 4-point Likert scale from 1 to 4

[b] Answers on a 6-point Likert scale from 1 to 6

the development of satisfaction over time are expected. Although the scale consists of only three items, the corresponding Cronbach's alpha was very satisfactory (see Table 3), with .86 (t_1), .88 (t_2), .87 (t_3) and .88 (t_4). Whereas learning motivation clearly refers to the school learning of E&S, the scale of training satisfaction addresses the apprenticeship training as a combination of all learning venues.

Measurement of apprentices' professional intention to remain

The intention to remain was measured with a single item, formulated as follows: *'Do you want to continue working within the commercial field after the apprenticeship?'* The answer possibilities were 'no,' 'maybe/undecided' and 'yes.'

Model of influence

Based on theoretical considerations (see *Background* section), it is expected that learning motivation, apprenticeship satisfaction and the intention to remain develop interdependently. Therefore, a cross-lagged structural equation model was designed (panel study). Figure 1 depicts the assumed model of influence.

Research questions and hypotheses

This paper focuses on two main research questions. First, we want to investigate the status quo of remaining intentions and further education plans.

1. What is the status quo regarding remaining intentions, follow-up solutions and further education plans at the end of commercial apprenticeship training (measurement point 4), and are there any profile-related differences?

The first research question is of an explorative descriptive nature. In alignment with Seeber (2013) as well as Wicki and Kraft (2013) we assume that the majority of apprentices intend to remain within the occupation and have already found a follow-up solution two to three months before completing the apprenticeship training. Furthermore, we expect that the majority of apprentices with a working position in the commercial

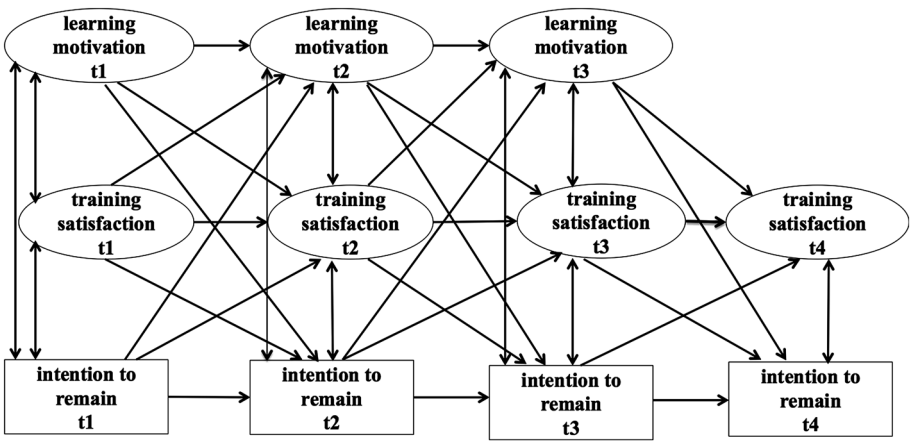

Fig. 1 Model of influence: a trivariate cross-lagged structural equation model

field remain within their training company. Since commercial VET is basic education to work in all branches with little specialization, we assume a high willingness to attend further education within the commercial field. Given the different qualifications at the end of VET, we expect M-Profile apprentices to intend to study at universities (of applied sciences) more often than E-Profile apprentices do.

- **H1a** The majority of apprentices intend to remain within their learned occupation at the end of apprenticeship training.
- **H1b** The majority of apprentices have already found a follow-up solution at the fourth measurement point.
- **H1c** The majority of apprentices who continue working in the commercial field received a follow-up contract from their training companies.
- **H1d** Commercial apprentices are highly willing to attend further education within the next 5 years.
- **H1e** M-Profile apprentices are more likely to intend to study in tertiary education than E-Profile apprentices are.

Second, we want to study the interdependence of the development of the intention to remain, learning motivation and training satisfaction.

2. How do learning motivation and training satisfaction influence the change in the intention to remain within the occupation?

With regard to the development of the intention to remain within the occupation as well as learning motivation and training satisfaction, we expect reciprocal positive influences.

- **H2a** Learning motivation at t positively influences the change in the intention to remain (t to t_{+1}).
- **H2b** Training satisfaction at t positively influences the change in the intention to remain (t to t_{+1}).
- **H2c** The intention to remain at t positively influences changes in learning motivation as well as training satisfaction (t to t_{+1}).

Results

Status quo

At the end of their apprenticeship training, two to three months before training completion 671 (57.7%) commercial apprentices intended to stay within the commercial field, 282 (24.2%) apprentices were undecided, and 210 (18.1%) apprentices denied any further remaining intentions (valid n = 1163). No significant Chi-square difference test was obtained between apprentices in the E- and M-Profile. A total of 677 (59.4%) apprentices already had a follow-up working contract (valid n = 1140), and 578 (85.4%) of these 677 apprentices had a further employment in their training company. Comparing the follow-up solutions between the profiles, a significant Chi-square test was found: $X^2(1) = 21.289$; $p < .01$. Apprentices in the M-Profile were in the category of having follow-up employment more often than expected and were less often in the category with no

follow-up employment. The pattern for the apprentices in the E-Profile was the opposite. The Cramer's V showed a small but significant relation between the two categorical variables (.137; $p < .001$). The 463 apprentices (40.6%) who did not yet have follow-up employment cited the following reasons: search without success (21.1%), subsequent education (20.4%), not yet applied for a position (18.2%), language-learning holiday (9.3%) and military service (8%). Some apprentices had not yet received a decision on their application(s).

Another point of interest was the apprentices' further education intentions. The apprentices could indicate whether they considered further education. In general, only 68 apprentices (5.9%) denied any further education intentions within the next five years, but 262 apprentices (22.6%) were undecided in their intentions. Of the 1161 apprentices, the following possible educational tracks were considered: university of applied sciences (41%), federal vocational baccalaureate (20.8%), college of higher education (18.7%), federal examinations (13.6%), university or federal institute of technology (12.3%), university of teacher education (12.2%), federal baccalaureate (3.6%) or another vocational apprenticeship (3.4%). Comparing the further education intentions of apprentices in the different profiles, some significant differences were found (see Table 4). On the one hand, apprentices in the E-Profile intended more often than expected to start another apprenticeship training. They also intended more often to add a federal vocational baccalaureate and to complete federal examinations more often than expected and more than compared with apprentices in the M-Profile, which seems obvious because learners in the M-Profile already complete a federal vocational baccalaureate. On the other hand, apprentices in the M-Profile intended more often than expected to attend a university of applied sciences, to enroll in a university of teacher education or to subsequently study at a university of a federal institute of technology compared to the E-Profile apprentices. Again, with the achievement of the federal vocational baccalaureate, apprentices in the M-Profile are already qualified to enter this educational track. Cramer's V reveals only small effect sizes (see Table 4). The largest effect was found with regard to the completion of a federal vocational baccalaureate (Cramer's $V = .494$; $p < .001$). Apprentices in the M-Profile are already graduating in this educational track and therefore do not need to start again. Another moderate relation was found between the profile and the intention to attend a university of applied sciences (Cramer's $V = .341$).

Trivariate cross-lagged model

To study the second research question and the related hypothesis, a trivariate cross-lagged model was calculated (see Fig. 1). Before delving into the results, some explanations for the statistical analyses are provided. The approach of statistical analysis was structured in the style of an unpublished manuscript written by Burke et al. (in preparation).

Analysis strategy

After testing for measurement validity (see *Scales and measures* section), the longitudinal development of the two latent constructs (learning motivation and training satisfaction) was modeled by means of two separate latent state models. In line with recent recommendations by Little (2013), we used the effect coding method (instead of fixing the latent

Table 4 Profile differences regarding the status quo of remaining intentions and further education plans

	E-Profile		M-Profile		χ^2 (df)	Cramer's V
	n	%	n	%		
Remaining intention						
Yes	328	56	343	59.4		
Maybe	157	26.8	125	21.7		
No	101	17.2	109	18.9	ns	ns
Valid n	586		577			
Follow-up employment						
Yes	305	52.8	372	66.2		
No	273	47.2	190	33.8	21.289 (1)***	.137***
Valid n	578		562			
Further education intentions						
Valid n	586		575			
Another apprenticeship						
Yes	31	5.3	8	1.4		
No	555	94.7	567	98.6	13.586 (1)***	.108***
Federal vocational baccalaureate						
Yes	238	40.6	3	.5		
No	348	59.4	572	99.5	283.61 (1)***	.494***
Federal baccalaureate						
Yes	17	2.9	25	4.3		
No	569	97.1	550	97.1	ns	ns
Federal examinations						
Yes	102	17.4	56	9.7		
No	484	82.6	519	90.3	14.511 (1)***	.112***
College of higher education						
Yes	111	18.9	106	11.8		
No	475	81.1	469	81.6	ns	ns
University of applied sciences						
Yes	143	24.4	333	57.9		
No	443	75.6	242	42.1	134.728 (1)***	.341***
University of teacher education						
Yes	42	7.2	70	12.2		
No	544	92.8	505	92.8	.8346 (1)**	.085**
University/federal institute of technology						
Yes	54	9.2	89	15.5		
No	532	90.8	486	84.5	10.542 (1)**	.095**
No further education within next 5 years						
Yes	44	7.5	24	4.2		
No	542	92.5	551	95.8	5.853 (1)*	.071*
Undecided about further education plans						
Yes	159	27.1	103	17.9		
No	427	72.9	472	82.1	14.229 (1)***	.110***

ns non significant

*** $p < .001$

** $p < .01$

* $p < .05$

Table 5 Measurement invariance of training satisfaction and learning motivation over time

Invariance	χ^2	df	p	χ^2/df	Scaling factor	CFI	RMSEA	SRMR	$\Delta\chi^{2+}$ *Sig Test*	ΔCFI
Latent measurement model of training satisfaction (n = 1842)										
Configurale invariance	26.871	30	ns	.90	1.2299	1.00	.00	.013	–	–
Metric invariance	50.915*	36	.051	1.41	1.2259	.998	.15	.030	24.3536 (3)***	.002
Scalar invariance	104.982	42	***	2.50	1.1971	.992	.029	.029	83.00 (12)***	.008
Latent measurement model of learning motivation (n = 1838)										
Configurale invariance	90.888	39	***		1.0936	.99	.027	.030		
Metric invariance	125.252	45	***		1.0949	.985	.031	.043	34.2079 (6)***	.005
Scalar invariance	207.150	51	***		1.0831	.971	.041	.051	119.134 (12)***	.019
Partial scalar invariance [Intrinsic motivation t_1]*	157.999	50	***		1.0895	.98	.034	.048	67.6719 (11)***	.01

ns non significant

*** $p < .001$

** $p < .01$

* $p < .05$

+ Corrected according to Satorra-Bentler

construct's variance at 1 or the marker indicator) to identify the model. Each construct was tested toward its measurement invariance by constraining the factor loadings as well as the intercepts to be equal across time. Scalar invariance (also called strong factorial invariance) is a necessary condition to compare the same constructs over time (Little 2013; Geiser 2011). Furthermore, the unique variances (error variances) of the same indicators of different measurement occasions were allowed to correlate with each other. The model with correlated error variances but no other constraints was labeled the unconstrained model, which defines the basic model for comparison (see Table 5). To evaluate the fit of the models the following fit indices were used (Hu and Bentler 1999): the ratio between the Chi-square (χ^2) and the degrees of freedom (*df*), the Comparative Fit Index (CFI > .95), the Root Mean Square Error of Approximation (RMSEA < .06) and the Standardized Root Mean Square Residuals (SRMR < .05). In the next step, metric invariance (the same factor loadings across times, also called weak factorial invariance) was calculated and compared with the unconstrained model. Since the Chi-square difference test is known to be sensitive when sample sizes are large, the delta in the CFI was used as a criterion to judge measurement invariance. Cheung and Rensvold (2002) as well as Little (2013) recommend to consider any differences in the CFI of .01 or smaller to be a confirmation of measurement invariance. In the next step, the two latent state models were combined under the manifest item 'intention to remain' to form a trivariate cross-lagged model. Since we were interested in comparing the effects over time, phantom variables on each latent construct were included. Phantom constructs "does not have any measured indicators" (Little 2013, p. 103) but "is derived from information found in other constructs" (Little 2013, p. 103). Phantom constructs allow to "estimate parameters in a common standardized metric [standard deviations instead of variances and correlations instead of covariances, authors' annotation]" (Little 2013, p. 103) and allow for a comparison of the strength of association even when the variances and covariances differ (Little 2013). In the following, these phantom variables will be treated as if they were original variables to facilitate the understanding and interpretation of the results. To address missing data issues, the full information maximum likelihood (FIML, Muthén and Muthén 1998–2012) was used under the assumption of missing at random (MAR).

Nested data structure

The data collected in the present study have a multilevel structure of four levels: cantons, school, classes and individuals. To take the hierarchical structure into account, a multilevel approach was used. Given the rather low count of cantons and schools compared to classes, it was only clustered for classes. Thus, "if the unequal probability of selection is not incorporated in the analysis, a substantial bias in the parameter estimate may arise" (Asparouhov 2005, p. 249). However, in an earlier study (Forster-Heinzer 2016), it was found that the class level only accounts for 3% of the variance of learning motivation; therefore, a sandwich estimator was used (Muthén and Asparouhov 2011). The sandwich estimator accounts for the clustering in the data and corrects standard errors, which leads to fewer biases.

Latent state models and measurement invariance

Table 5 reports the results of the scalar invariance testing regarding the two latent constructs training satisfaction and learning motivation. A robust Maximum Likelihood

estimator (MLR) was used to calculate the model. Consequently, the Satorra-Bentler Chi-square difference test was used in order to better approximate Chi-square under non-normality (https://www.statmodel.com/chidiff.shtml). With respect to training satisfaction, even though significant Chi-square difference tests are obtained, the CFI changes less than .01 in its value when testing for metric as well as scalar invariance. Therefore, we assume scalar invariance for training satisfaction over time. To reduce the complexity of the measurement model, the four sub-dimensions of learning motivation were treated as single indicators after parceling the relative items. Consequently, each sub-dimension is defined by the mean of the summarized items of that sub-dimension. As Table 5 reveals, the assumption of scalar invariance was not confirmed. Thus, not only was the Satorra-Bentler corrected Chi-square difference test significant, but the CFI changed more than .01. After freely estimating the intercept of the sub-dimension of self-determined motivation at t_1, the change in the CFI equals .01. Therefore, partial scalar invariance was assumed. Regarding the development of the single constructs, a decreasing tendency was found. At t_1 the mean scores for learning motivation were 4.059 (S.E. = .055), at t_2 3.848 (S.E. = .055) and at t_3 3.756 (S.E. = .058). However, the decrease in the mean score was only small. Similar results were found with regard to training satisfaction. The initial mean score was 4.955 (S.E. = .029), 4.521 (S.E. = .03) at t_2, and 4.259 (S.E. = .031) at t_3, 4.202 (S.E. = .032) at t_4. Likewise, the developmental decrease was small, and the mean scores for training satisfaction at the end of the apprenticeship training remained at a high level. A slight difference was found in the intention to remain within the learned occupation. Again, a decrease was found between the first and third measurement points: 1.422 (S.E. = .015) at t_1, 1.375 (S.E. = .018) at t_2 and 1.325 (S.E. = .021) at t_3. At the last measurement point (t_4), however, the mean was lower than at t_1 but higher than at t_2 and t_3 (mean = 1.387, S.E. = 022).

Change effects in the trivariate cross-lagged model

Proceeding with the partial scalar invariance constraints, a cross-lagged model with phantom constructs was calculated. All regressive paths were freely estimated (see Table 6, rows 2–5). The goodness of fit was satisfactory: $\chi^2 = 829.563$, df = 313, p < .001, χ^2/df = 2.65; CFI = .972; RMSEA = .030 and SRMR = .045. To study the stability (stationarity) of the effects over time, the autoregressive paths and the cross-lagged regressive paths were constrained to be equal over time in a stepwise procedure (Table 6, row 6). When fixing all autoregressive and cross-lagged regressive paths of the same constructs to be equal, the following fit was obtained: $\chi^2 = 876.248$, df = 328, p < .001, χ^2/df = 2.67; CFI = .97; RMSEA = .030 and SRMR = .045. The Satorra-Bentler corrected Chi-square difference test is significant, but the CFI changes less than .01. Therefore, even with all paths constrained to be equal, the model still has a very good fit. Considering the model with all regressive (and autoregressive) paths freely estimated, we observed some differences. Learning motivation at t_1 has a small significant influence on the intention to remain at t_2, but from t_2 to t_3 and from t_3 to t_4, this influence is no longer significant. If we constrain the regressive paths to be equal, learning motivation does not significantly impact the change in the intention to remain within the occupation. However, training satisfaction has a small but steady influence on the intention to remain (.157*** when constrained to be equal). Its influence is the strongest from t_2 to t_3 if the

Table 6 Standardized results for the trivariate cross-lagged model for intention to remain, training satisfaction and learning motivation

	$t_1 \rightarrow t_2$		$t_2 \rightarrow t_3$		$t_3 \rightarrow t_4$		Equality constraints	
	β	SE	*β*	SE	*β*	SE	*β*	SE
Autoregressive paths								
Training satisfaction	.473***	.047	.678***	.032	.645***	.043	.601***	.032
Learning motivation	.711***	.031	.793***	.027	–	–	.749***	.021
Intention to remain	.401***	.030	.434***	.033	.624***	.033	.49***	.023
Cross-lagged paths								
Training satisfaction → intention to remain	.115**	.044	.182***	.037	.140***	.040	.157***	.026
Learning motivation → intention to remain	.083*	.040	.025 ns	.035	.014 ns	.035	.029 ns	.022
Training satisfaction → learning motivation	.010 ns	.034	.010 ns	.037	–	–	.010 ns	.026
Learning motivation → training satisfaction	.133**	.044	.068*	.036	.116**	.040	.101***	.022
Intention to remain → training satisfaction	.147***	.030	.091**	.032	.107***	.027	.129***	.019
Intention to remain → learning motivation	−.017 ns	.030	.021 ns	.030	–	–	.011 ns	.036

ns non significant

*** $p < .001$

** $p < .01$

* $p < .05$

regressive paths are freely estimated. In contrast, the influence of learning motivation on training satisfaction and the intention to remain on training satisfaction is the lowest from t_2 to t_3. Although learning motivation has a significant regressive path on training satisfaction, the training satisfaction at t seems not to influence the learning motivation at t_{+1}. The intention to remain within the occupation at t_1 significantly influences the change in training satisfaction (t_{+1}) but not the change in learning motivation (t_{+1}). For the intention to remain within the occupation, it was found that 29% of the variance was explained at t_2, 38% was explained at t_3 and 43% was explained at t_4. More variance was explained for the other two constructs. For training satisfaction the variance explained was 42% at t_2, 56% at t_3 and 63% at t_4; for learning motivation 49% at t_2 and 65% at t_3. When controlling for the profiles, three small impacts were found. At the beginning of apprenticeship satisfaction, apprentices of the E-Profile intended to remain within the occupation more often than M-Profile apprentices did ($\beta = -.12$; $p < .05$, S.E. $= .05$), and they seemed to be more motivated to learn ($\beta = -.19$; $p < .01$, S.E. $= .07$). However, these difference were only significant at the beginning (t_1). After 14 months (t_2), apprentices in the M-Profile were more satisfied with their apprenticeship training ($\beta = .13$; $p < .05$, S.E. $= .05$) than E-Profile apprentices were. This effect was no longer found at t_3 and t_4.

Discussion

In this article, we focused on two objectives: (1) to report the status quo of commercial apprentices' further career and educational intentions and (2) to analyze the development of the intention to remain within the learned profession in interdependency with training satisfaction and learning motivation as important determinants. We found some results that confirmed the findings of previous studies in the same or a similar field. Whereas Seeber (2013) found that only one-third of commercial apprentices in

Germany had a follow-up solution 2–3 months before graduation, in our study, this number was nearly 60% (confirmation of hypothesis H1b). This result corresponds to another Swiss study conducted by Wicki and Kraft (2013), which asked commercial apprentices shortly after graduation. In accordance with both studies, our study found that most commercial apprentices with follow-up employment stayed within their training company (85.4%, confirmation of hypothesis H1c). As Wicki and Kraft (2013) found, apprentices in the M-Profile were more often in the category of follow-up solutions than the E-Profile apprentices were. However, this result is surprising, because the vocational baccalaureate (achieved by M-Profile apprentices) qualifies apprentices to study at university of applied sciences. Instead, companies seem to attract M-Profile graduates to remain in the occupation short-term, even with further education aspirations. This fact calls for follow-up studies analyzing realized further pathways after completing commercial VET program in the mid- and long-term.

For only 8.6% of the apprentices questioned at the beginning of their training, commercial apprenticeship was a compromise solution. At the end of the apprenticeship, however, only 57.7% were certain that they would remain within the commercial field after training; 24.2% were still undecided a few months before graduation, and for 18.1%, remaining within the learned occupation was not an option. Therefore, almost one in five apprentices does not intend to remain within the commercial field, and one in four apprentices is undecided. Nevertheless, the majority of apprentices intend to remain (confirmation of hypothesis H1a). Another interesting finding is the high willingness to continue further education (hypothesis H1d). Only 6% denied having any further education plans within the next five years. This result reflects the apprentices' awareness of the importance of lifelong learning and the acquisition of additional certificates. As expected, apprentices in the M-Profile more often intended to study in tertiary education than E-Profile apprentices did at measurement point t_4 (confirmation of hypothesis H1e). However, almost 21% of the E-Profile apprentices intended to receive a federal baccalaureate, which qualifies them to enter the tertiary education.

With regard to development, a decrease in learning motivation, as reported by Hardt et al. (1996) and Prenzel et al. (1996), as well as a decrease of training satisfaction were found. However, learning motivation remained at a high level at the end of apprenticeship, as did training satisfaction. According to Holland (1985), motivation is assumed to have a positive influence on professional satisfaction and is considered a key element in remaining within the profession (Jiménez 2002; Lambert et al. 2001). Although a positive causal impact of learning motivation on training satisfaction was found, no direct significant causal influence was confirmed from learning motivation to the intention to remain. Likewise, the intention to remain did not have a positive impact on learning motivation, nor did training satisfaction. However, a reciprocal influence of training satisfaction and the intention to remain was found. Although there is no direct impact of the motivation to learn more about economics and society (E&S), learning motivation positively impacts training satisfaction, which positively impacts the intention to remain within the learned occupation. Consequently, hypothesis 2a must be rejected. We confirmed hypothesis 2b and partially confirmed hypothesis 2c with regard to the interdependence of training satisfaction and the intention to remain. The missing impact of learning motivation at t on the intention to remain at t_{+1} challenges our assumption

that school-oriented learning motivation is important for the intention to remain within the occupation. This disturbing result questions whether the vocational school as an important learning venue of VET has generally an influence on the intention to remain within the learned occupation. However, the intention to remain at t impacts the training satisfaction at t_{+1} and vice versa. Reviewing the operationalization of the constructs reveals that training satisfaction covers all learning venues of commercial apprenticeship. Therefore, we assume that the intention to remain and the training satisfaction are conceptually more related than the intention to remain and the rather school-related learning motivation.

Study's limitations

We would like to note some theoretical, methodological and empirical limitations of the current study and suggest alternative approaches. With the theoretical focus on self-determination and the interest theory of motivation, little explanatory effect was found on training satisfaction and none on the intention to remain within the occupation. Scheja (2009) emphasized that focusing on self-determined learning as the highest form of motivation would contradict pedagogical intentions in the context of lifelong learning. Learning motivation was operationalized in this study as a combination of intrinsic, instrumental and achievement-oriented motivation as well as interest. It would be interesting to examine how the single dimensions influence the development of the intention to remain. Furthermore, there might be alternative approaches to motivation that may explain more variance in the intention to remain within the occupation, such as the expectancy-value theory of motivation (Wigfield and Eccles 2000), the theory of planned behavior (Ajzen 1991) or the person-fit-theory (Eccles et al. 1993; Neuenschwander 2010). In alignment with the theoretical focus on self-determined motivation and interested motivation, an instrument was used that has frequently been implemented in the field of VET research, but its factorial structure could not be replicated in the current study. With regard to empirical analysis, there are many avenues for future research. This study controlled for profile differences, but other differences, such as gender or branch, might be interesting as well. Furthermore, since an earlier study showed little explanatory power at the second level (class level), this study used a sandwich estimator to account for the hierarchical data structure. It would be interesting to consider all the different levels and to test for multi-group differences with regard to the interdependence of the constructs' development.

Conclusion

At the beginning, it was argued that apprentices, who are willing to remain within the learned occupation after graduation are important not only for training companies but also for the Swiss economy. Although commercial VET is not considerably affected by early termination (only approximately 5%, Heim et al. 2012), little is known about the remaining intentions of commercial apprentices after graduation. The empirical data of this study showed that approximately 58% of the commercial apprentices questioned intended to remain within the commercial field. However, 18% did not intend to remain. An interesting issue for further analysis is that 24% of apprentices were still undecided a few months before graduation. The data showed that training satisfaction is

one explanation for this finding. However, the unexplained variance of the intention to remain at t_4 (57%) also shows that there must be other explanatory factors. Knowledge regarding the determinants of the intention to remain—and the intention itself—is useful for both Swiss economic policymakers and training companies. Given that determinants, such as satisfaction with apprenticeship, also influence the intention to remain, these determinants should be investigated in more detail. Such insights would provide teachers, trainers, and educators with more information so that they may positively influence intentions to remain.

Additional file

Additional file 1: Table S1. Percentaged distribution of apprentices starting their vocational training in one of the 21 commercial branches in Switzerland.

Authors' contributions

SFH had the lead of authorship, drafted and developed the manuscript and performed the statistical analysis. DH reviewed the manuscript critically and contributed significantly in improving it. Furthermore, DH added the abstract and conclusion and participated in the design and structure of the study. SRM also critically reviewed the manuscript and reformulated parts of it. Moreover, SRM carried out the survey study and prepared the data for analysis. FE critically reviewed the manuscript and developed the design of the study. In addition FE participated in the development of instruments and contributed importantly to the data collection. All authors discussed the reviews and contributed importantly to this revised version. All authors read and approved the final manuscript.

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Competing interests

The authors declare that they have no competing interests.

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